

Curriculum Vitae

Personal Information

First Name:	Junze	Last Name:	Yuan
Email:	yuanjunze@mail.nwpu.edu.cn		
Research Interests:	robotics, intelligent manufacturing systems, mechatronics, machine vision		
Supervisor:	Prof. Xiansheng Qin	xsqin@nwpu.edu.cn	

EDUCATIONAL EXPERIENCES

09.2020-04.2023	MSc	Northwestern Polytechnical University	Mechatronics
09.2016-07.2020	BSc	Northwestern Polytechnical University	Mechatronics

RESEARCH PROJECTS & RESEARCH EXPERIENCES

1. Collaborative Robotic Welding System:

To improve the flexibility of welding and reduce dependence on the skills of human operators, a mobile welding system based on a collaborative robot is presented and built. This system has been proven to perform high-quality welding with human-machine collaboration. As a core member of this project, I was involved in the entire process

- Developed the human-machine interface software to simplify robot operation and enhance its efficiency through a more direct and efficient control interface.
- Developed collaborative robot control programs
- Designed the structure and established a three-dimensional working environment for simulation of the system to ensure safe equipment operation.

2. Robotic Scraping System for Kneading Mixer:

To enhance propellant mixing efficiency and safety, I contributed to the development of a robotic scraping system for the kneading mixer, the primary equipment for mixing solid rocket propellants.

- Integrated machine vision into the system to obtain clear images of the blade for accurate blade posture determination when stopped spinning.
- Planned robot trajectory based on a three-dimensional model of the kneading mixer.
- Established a three-dimensional working environment for robot simulation and offline programming in Solidworks and DELMIA.

3. Robotic polishing system:

To enhance the efficiency and quality of complex surface polishing, a robotic polishing system is presented and built.

- Designed a polishing sandpaper quick-change device to improve the automation of the equipment.
- Established a three-dimensional working environment for robot trajectory simulation and generated robot control programs in DELMIA.

GRADUATION THESIS

Mobile Welding System Based on Collaborative Robot:

Developed a mobile welding system based on a collaborative robot for crane manufacturing to improve welding efficiency and accuracy. Proposed a human-machine collaborative weld positioning method, a mobile collaborative robotic welding process, and a real-time seam tracking method based on line laser vision. Designed the mechanical structure, control

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system, and software for the system, and conducted experiments to verify the feasibility of the proposed methods. These research findings can contribute to the advancement of mobile welding technology and guide the development of similar systems in other manufacturing industries.

PUBLISHED PAPERS

- [1] Yuan J, Han H, Liu Y, et al. Mobile collaborative welding system for complex welding seams[J]. Procedia CIRP, 2022, 107: 1520-1525.

CONFERENCES

CMS 2022, the 55th edition of the CIRP International Conference on Manufacturing Systems
Mobile collaborative welding system for complex welding seams
29.06-01.07 2022; Lugano, Switzerland

PRIZES, AWARDS & HONOURS

1. Third Prize in the Mathematical Modeling Competition of NWPU, 2018
2. Outstanding winner of Chinese National College Robotic Students Intelligent Precision Assembly Competition, 2021
3. Second-class scholarship of Northwestern Polytechnical University, 2020-2021

SKILLS

3D-modelling software	Proficiency with Solidworks and Delmia for modelling and simulation
Programming language	Familiar with C/C++, C#, Python, and MATLAB
Others	Familiar with OpenCV and ROS
PLC programming	TwinCAT3

ENGLISH PROFICIENCY

English	IELTS 6.5 (Academic/obtained in 2022)
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VOLUNTARY ACTIVITY

Served as a teaching assistant in the course Electrical and Electronic Technology in 2021.

HOBBIES

Basketball, reading, guitar